KIT33813AEEVBE Evaluation Board

Featuring the MC33813 One Cylinder Small Engine Control IC
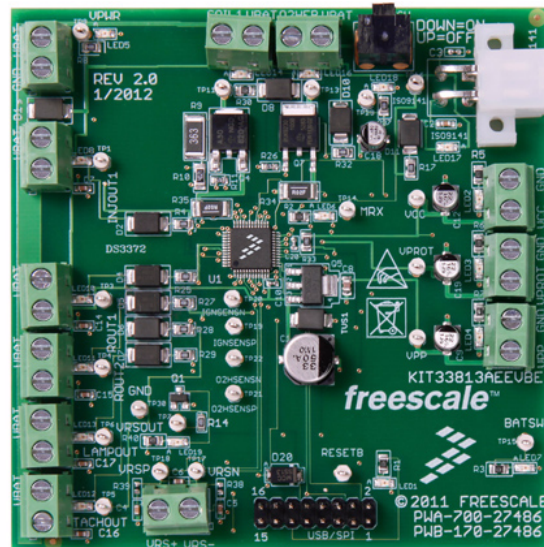

Figure 1. KIT33813AEEVBE Evaluation Board

Table of Contents

1 Kit Contents / Packing List

- Assembled and tested evaluation board/module in anti-static bag.
- Warranty card

2 Jump Start

- Go to www.freescale.com/analogtools
- Locate your kit
- Review your Tool Summary Page
- Look for

  ↗ Jump Start Your Design

- Download documents, software and other information

3   Important Notice

Freescale provides the enclosed product(s) under the following conditions:

This evaluation kit is intended for use of ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY. It is provided as a sample IC pre-soldered to a printed circuit board to make it easier to access inputs, outputs, and supply terminals. This EVB may be used with any development system or other source of I/O signals by simply connecting it to the host MCU or computer board via off-the-shelf cables. This EVB is not a Reference Design and is not intended to represent a final design recommendation for any particular application. Final device in an application will be heavily dependent on proper printed circuit board layout and heat sinking design as well as attention to supply filtering, transient suppression, and I/O signal quality.

The goods provided may not be complete in terms of required design, marketing, and or manufacturing related protective considerations, including product safety measures typically found in the end product incorporating the goods. Due to the open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge. In order to minimize risks associated with the customers applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards. For any safety concerns, contact Freescale sales and technical support services.

Should this evaluation kit not meet the specifications indicated in the kit, it may be returned within 30 days from the date of delivery and will be replaced by a new kit.

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4   Introduction

The KIT33813AEEVBE Evaluation Board is an easy-to-use circuit board that allows the user to exercise all the functions of the MC33813 one cylinder small engine control IC. A PC communicates to the EVB through a USB/SPI Dongle (KITUSBSPIDGLEVME) connected to the PC's USB port. The Freescale SPIGen (version 7.0) program provides the user interface to the MC33813 SPI port and allows the user to send commands to the IC and receive status from the IC.

5   Evaluation Board Features

This evaluation board consists of a MC33813 one cylinder small engine control IC, a USB to SPI Dongle interface, and power conditioning circuitry. All +5.0 V V_{CC} power required by the board is obtained from the MC33813 built-in power regulator. A +12 V V_{BAT} supply provides the power to the three internal voltage regulators.

6   MC33813 Device Features

The MC33813 is an engine control analog power IC intended for one cylinder motorcycle and other small engine control applications. The device supports the following functionality:

*   One fuel injector driver—typical of 1.3 A
*   One ignition IGBT or general purpose gate pre-driver
*   One O2 sensor (HEGO) heater general purpose gate pre-driver
*   Relay 1 driver, typically 2.0 A, can be used for fuel pump control
*   Relay 2 driver, typically 1.0 A, can be used as power relay control
*   Lamp driver, typically 1.0 A can also be used to drive an LED
*   Independent fault protection with all faults reported via the SPI
*   ISO 9141 K-line interface for communicating diagnostic messages
*   Start-up/shut-down control and power sequence logic
*   Interfaces directly to MCU using a 5.0 V SPI and logic I/O
*   Differential/single-ended VRS conditioning circuit

Freescale analog ICs are manufactured using the SMARTMOS process, a combinational BiCMOS manufacturing flow that integrates precision analog, power functions and dense CMOS logic together on a single cost-effective die.

7 Required Equipment

Minimum equipment required:
- Power supply 12 V with current limit set initially to 1.0 A
- Oscilloscope (4 channel preferably) with current probe
- Multimeter
- USB-enabled PC with Windows XP or higher
- SPIGen 7.0 or greater
- USB/SPI Dongle board (KITUSBSPIDGLEVME) plus 16-Pin Ribbon Cable
- Typical loads (DC servo motor, fuel injectors, solenoids, lamps, relays and tachometer)

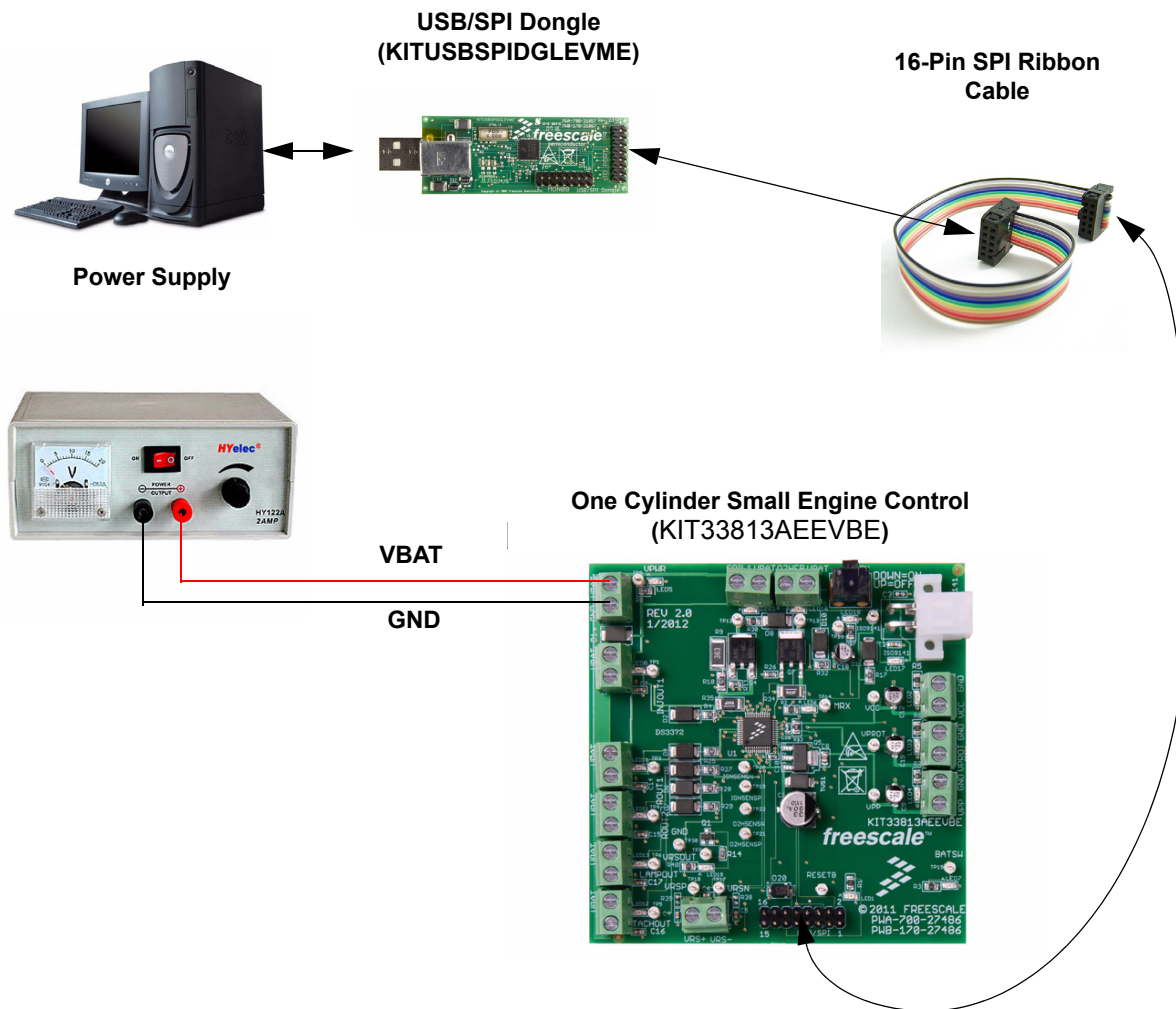# 8 Evaluation Board Configuration

Figure 2. KIT33813AEEVBE plus KITUSBSPIDGLEVME Board Setup

9   Installing SPIGen Freeware on your Computer

The latest version of SPIGen is designed to run on any Windows 8, Windows 7, Vista or XP-based operating system. To install the software, go to www.freescale.com/analogtools and select your kit. Click on that link to open the corresponding Tool Summary Page. Look for "Jump Start Your Design". Download to your computer desktop the SPIGen software as well as the associated configuration file.

Run the install program from the desktop. The Installation Wizard will guide you through the rest of the process.

To use SPIGen, go to the Windows Start menu, then Programs, then SPIGen, and click on the SPIGen icon. The SPIGen Graphic User Interface (GUI) will appear. Go to the file menu in the upper left hand corner of the GUI, and select "Open". In the file selection window that appears, set the "Files of type: " drop-down menu to "SPIGen Files (*.spi)". (As an exceptional case, the file name may have a .txt extension, in which case you should set the menu to "All Files (*.*)".) Next, browse for the configuration file you saved on your desktop earlier and select it. Click "Open", and SPIGen will create a specially configured SPI command generator for your evaluation board.

The GUI is shown in **Figure 3**. The text at the top is the name of the configuration file loaded. The left side panel displays folders that group user interfaces. The interfaces in the pre-installed MC33813 folder pertain specifically to the board under discussion.The process of loading the configuration file has assigned a list of "Extra Pins" as well as a list "Quick Commands", all of which are board-specific.
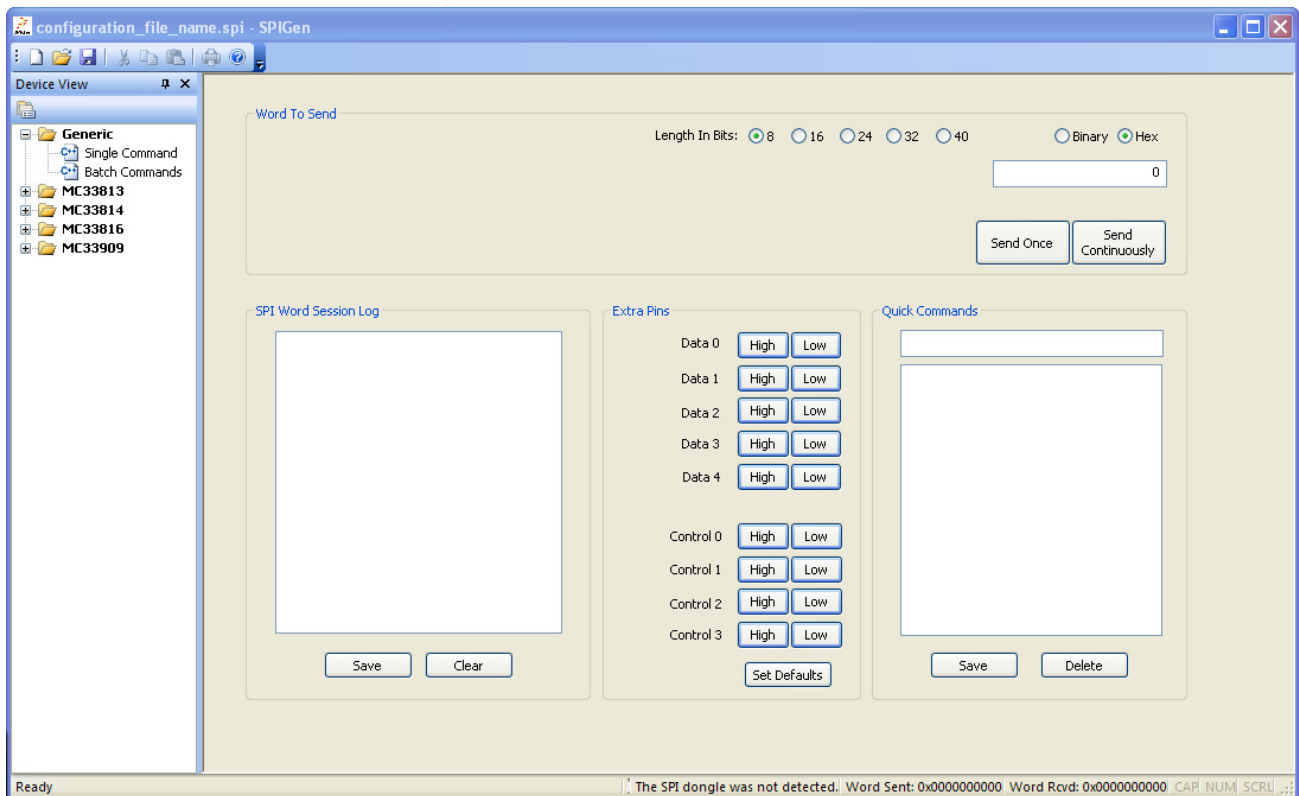

Figure 3. SPIGen GUI

10 Setup and Using the Hardware

To perform the examples included in the software bundle the following connections and setup must be performed:

1. Make sure the SPIGen (version 7.0X or greater) program is installed on the PC and it can communicate with the USB/SPI Dongle as described in that kit's documentation.

2. Connect the USB/SPI Dongle to the MC33813 EVB via a 16 pin ribbon cable. Make sure to orient the cable so that pin1 on both the USB/SPI Dongle and the MC33813 EVB are connected correctly, pin 1 to pin 1.

3. Connect the USB/SPI Dongle to a PC, LED 2 on the USB/SPI Dongle and the USB ON LED on the MC33813 board should both be illuminated.

4. Attach a +12 VDC supply (do not turn on power yet) to the VBAT input connector on the MC33813 EVB, making sure to observe the GND and +12V terminals. The current capability of the +12V supply should exceed the maximum total current that the number of simultaneously ON loads will require.

5. Attach loads to the COIL1, O2HFB, INJOUT1, ROUT1, ROUT2, LAMPOUT, TACHOUT and ISO9141 output terminals as desired.

6. Launch SPIGen and from the "**File**" menu, select "**Open**" and browse to the location of the "KIT33813SW.spi" file.

7. Turn on the +12 Volt Supply and set the KEYSW slide switch to the DOWN position. Verify that all is working correctly by observing the VPWR, VPP, VCC and VPROT LEDs which should all be illuminated. Click on the "Extra Pins" button in the SPIGen main screen and then click on the following buttons:

8. Click on the INJIN1 "**High**" button. The INJECTOR 1 load, INJOUT1, and LED should turn on. Clicking on the INJIN1 "**Low**" button should turn off the load and LED.

9. Click on the RIN1 "**High**" button. The RELAY 1 load, ROUT1 and LED should turn on. Clicking on the RIN1 "**Low**" button should turn off the RELAY 1 load, ROUT1 and LED.

10. Click on the RIN2 "**High**" button. The RELAY 2 load, ROUT2, and LED should turn on. Clicking on the RIN2 "**Low**" button should turn off the RELAY 2 load, ROUT2 and LED.

11. Click on the IGNIN1 "**High**" button. The COIL1 load and LED should turn on. Clicking on the IGNIN1 "**Low**" button should turn off the COIL1 load and LED.

12. Click on the O2HIN "**High**" button. The O2 Heater, O2HFB load and LED should turn on. Clicking on the O2HIN "**Low**" button should turn off the O2HFB load and LED.

13. Click on the Data 3 "**High**" button. The LAMP load and LED should turn on. Clicking on the DATA 3 "**Low**" button should turn off the LAMP load and LED.

14. Click on the Data 4 "**High**" button. The ISO9141 load should turn on. Clicking on the DATA 3 "**Low**" button should turn off the ISO9141 load.

If everything described so far occurs then you are ready to proceed with the remaining examples.

10.1   Example 1: Running the example batch files

1. Click on the "Batch Commands" Tab in the SPIGen main screen.

2. In the box below the "Commands to Send:" column is a pull-down menu box containing several batch file names. One of these example batch files is labeled "**TOGGLE ALL OUTPUTS**".

3. Click on this label to load it. You should see a list of commands in the "Command to Send" box.

4. Click on the "**Continuous**" button and observe that the loads and LEDs attached to the MC33813 EVB board are blinking on and then going out in succession.

There are other demo batch examples that can be run and examined for learning how to use the EVB.

11 Evaluation Board Hardware Description

This EVB consists of a MC33813 Small Engine Control Integrated Circuit (IC), a USB to SPI Dongle interface, and power conditioning circuitry. All +5 volt VCC power required by the EVB is obtained from the MC33813 built-in power regulator. A +12V VBAT supply provides the power to the three internal voltage regulators.
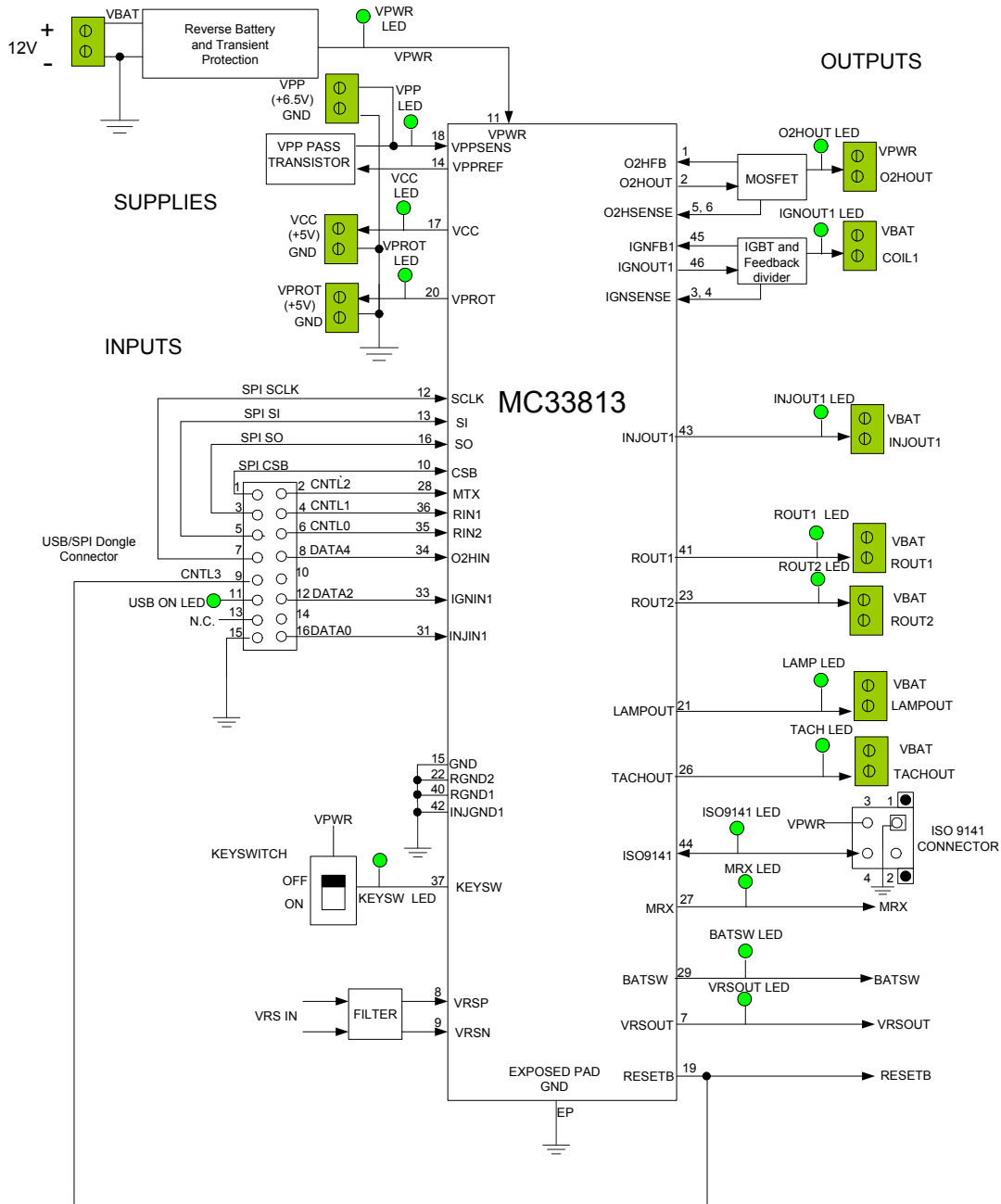
Figure 4. KIT33813AEEVBE Evaluation Board Block Diagram

11.1　LED Display

Seventeen LED's are provided as visual output devices for the MC33813 EVB board. A list of the LED devices is shown below:

1. VPWR LED - Indicates when +12 Volt supply is connected to the EVB.

2. VPP LED - Indicates that the VPP Pre-Regulator is supplying +6.5 volts to the two +5 Volt regulators, VCC and VPROT.

3. VCC LED - Indicates that the MC33813 internal +5 Volt regulator is running and providing the +5 Volt VCC voltage supply.

4. VPROT LED - Indicates that the VPROT +5 Volt regulator is turned on and is supplying 5V.

5. KEYSW LED - Indicates when the Key-Switch is turned on supplying +12V to the KEYSW input.

6. IGNOUT1 LED - Indicates that the Ignition Input, IGNIN1 or SPI bit, is active and the Ignition 1 Output driver is turned on.

7. O2HOUT LED - Indicates that the O2HIN Input or the SPI bit is active and the O2 Heater Driver Output is turned on.

8. INJOUT1 LED - Indicates that the Injector 1 Input, INJIN1 or SPI bit, is active and the Injector 1 Output is pulled low.

9. ROUT1 LED - Indicates that the Relay 1 Input RIN1, or SPI bit, is active and the Relay 1 Output is pulled low.

10. ROUT2 LED - Indicates that the Relay 2 Input RIN2, or SPI bit, is active and the Relay 2 Output is pulled low.

11. LAMPOUT LED - Indicates that the Lamp SPI control bit is active and the LAMPOUT pin is pulled low.

12. VRSOUT LED - Indicates that there is activity on the VRSN and VRSP pins and that the VRS circuit has detected a valid VRS signal.

13. TACHOUT LED - Indicates the state of the TACHOUT output signal.

14. MRX LED - Indicates the state of the MRX line as a result of the data on the ISO9141 line.

15. BATSW LED - Indicates the State of the on-board Key Switch. When the Key Switch is ON the BATSW LED is ON. ROUT2

16. USB LED - Indicates that the USB SPI dongle is connected properly and is attached to an active USB port on a PC.

17. ISO9141 LED - Indicates the state of the ISO9141 line. When this LED is ON the ISO9141 line is LOW and when the LED is OFF the ISO9141 line is HIGH.

11.2　Test Point Definitions

The EVB contains 24 test point jumpers that provide access to certain signals in the MC33813 as follows:

1. VPWR - 12 Volts (VBAT minus Schottky diode drop)

2. GND - 0 Volts

3. VPP - 6.5 Volts

4. VCC - 5.0 Volts

5. VPROT - 5.0 Volts

6. BATSW - 0 or 5.0 Volts depending on the state of KEYSW

7.   KEYSW - 0 or 12 Volts depending on the state of KEYSW

8.   ISO9141 - 0 or 12 Volts depending on the state of MTX

9.   MRX - 0 or 5 Volts depending on the state of ISO9141 line.

10. VRSOUT - 0 or 5 Volts depending on the VRSN and VRSP inputs

11. TACHOUT - 0 or 5 Volts depending on VRSOUT or internal SPI bits.

12. LAMPOUT - 0 or 12 Volts depending on the SPI bits

13. ROUT2 - 0 or 12 Volts depending on RIN2 or internal SPI bits.

14. ROUT1 - 0 or 12 Volts depending on RIN1 or internal SPI bits.

15. INJOUT1 - 0 or 12 Volts depending on INJIN1 or internal SPI bits.

16. COIL2 - 0 or 12 Volts depending on IGNIN2 or internal SPI bits.

17. COIL1 - 0 or 12 Volts depending on IGNIN1 or internal SPI bits.

18. O2HFB - 0 or 12 Volts depending on O2HOUT or internal SPI bits.

19. VRSN - -0.3 to 5 Volts (clamped internally) from VRS low side.

20. VRSP - -0.3 to 5 Volts (clamped internally) from VRS high side.

21. O2HSENSN - Ground side of O2H Driver current sense resistor (.02 ohms)

22. O2HSENSP - High side of O2H Driver current sense resistor (.02 ohms)

23. IGNSENSN - Ground side of IGN1/2 Driver current sense resistor (.02 ohms)

24. IGNSENSP - High side of IGN1/2 Driver current sense resistor (.02 ohms)

11.3   Input Signal Definitions

The MC33813 has seven logic level input signals that are used to control certain outputs or functions inside the circuit. These seven signals are:

1.   O2HIN - Controls the O2 Heater Pre-Driver output

2.   IGNIN1 - Controls the Ignition 1 Pre-Driver output

3.   INJIN1 - Controls the state of the INJOUT1 output

4.   RIN1 - Controls the state of the ROUT1 output

5.   RIN2 - Controls the state of the ROUT2 output

6.   MTX - Provides the transmit data to the ISO9141 line

7.   RESETB - When the RESETB line is held low, the MC33813 inhibits the internal watchdog reset.

These seven signals are provided by the seven parallel outputs from the USB/SPI interface as described below:

1.   O2HIN- Connected to the DATA4 signal

2.   IGNIN1 - Connected to the DATA2 signal

3.   INJIN1 - Connected to the DATA0 signal

4. RIN1 - Connected to the CNTL1 signal

5. RIN2 - Connected to the CNTL0 signal

6. MTX - Connected to the CNTL2 signal

7. RESETB - Connected to the CNTL3 signal

DATA0 -DATA4 and CNTL0-CNTL3 signals are logic level outputs from the USB/SPI Dongle that can be controlled directly from the SPIGen program. An example SPIGEN configuration file called "KIT33813SW.spi" is provided in the software bundle which contains several batch file examples.

If the user prefers to supply the various MC33813 input signals externally, other than from the USB-SPI Interface, the connections are available on the connector listed below.

11.4   USB/SPI Dongle Connector

The USB/SPI dongle connector is a 16-pin, .1" center, dual-row connector that is designed to interface directly to the USB/SPI Dongle unit (KITUSBSPIDGLEVME). This connector mates with the 16-conductor flat cable that connects to the USB/SPI Dongle.The USB/SPI dongle connector consists of the following 16 pins.

Table 1. USB/SPI Dongle Pin Description

Pin Number	Name	Description
1	CSB	SPI signal, Chip Select Bar
2	CNTL2	CNTL2 connected to MTX
3	SO	SPI signal, Serial Out
4	CNTL1	CNTL1 connected to RIN1
5	SI	SPI signal, Serial In
6	CNTL0	CNTL0 connected to RIN2
7	SCLK	SPI signal, Serial Clock
8	DATA4	DATA4 connected to O2HIN
9	CNTL3	CNTL3 connected to RESETB
10	DATA3	NC
11	VDD	+5.0 Volt VDD from USB
12	DATA2	DATA2 connected to IGNIN1
13	+3.3V	+3.3 V from USB (Not Used on this EVB)
14	DATA1	NC
15	GND	Signal Ground
16	DATA0	DATA0 connected to INJIN1

11.5   Screw Terminal Connections

The MC33813 board contains ten output and two input screw terminal connections and one 4 pin I/O connector to allow easy access to the MC33813's circuits.

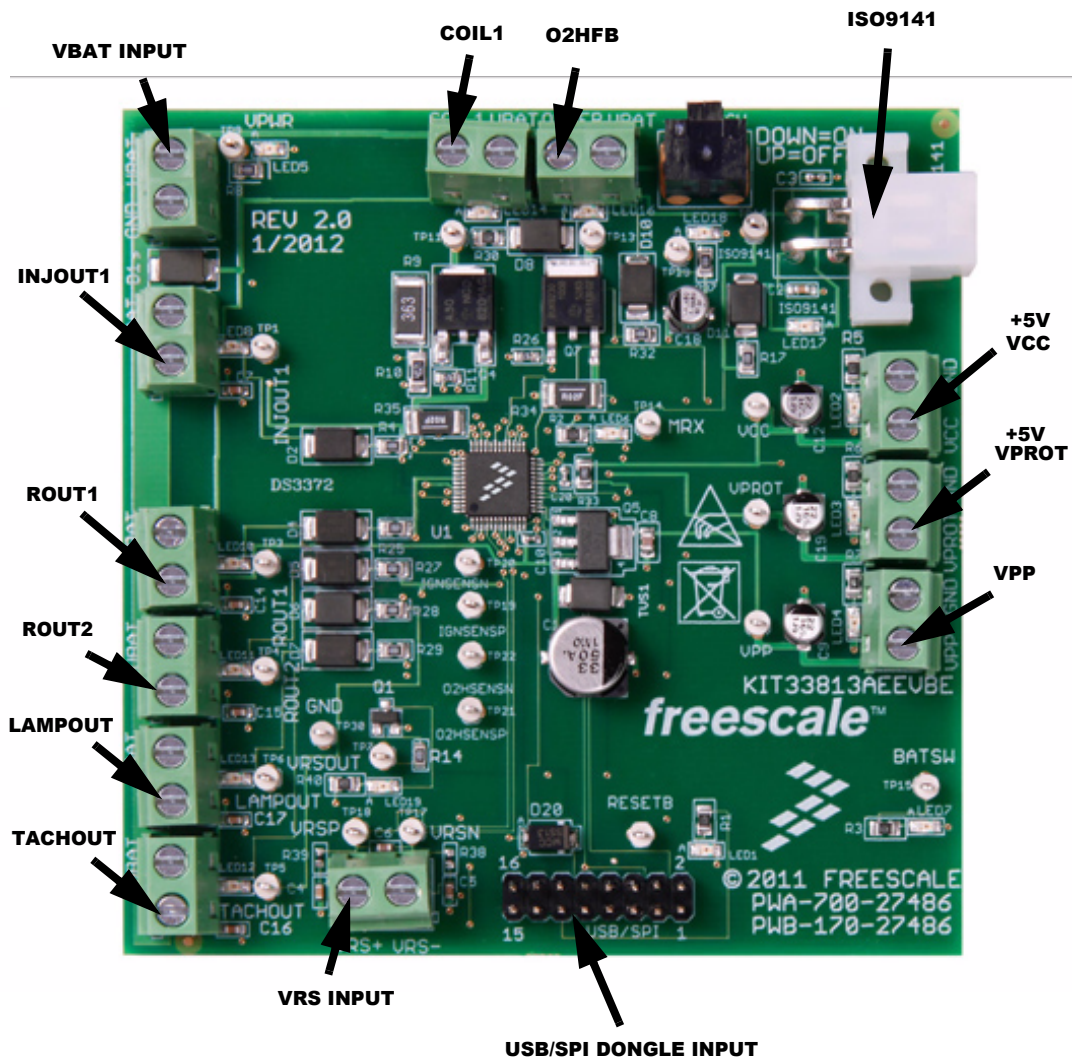Figure 5 shows the locations of the screw terminals and their functional definitions.

Figure 5. Connector Designations

11.6 Evaluation Board Connectors

11.6.1 Input Connectors

There are 2 Input Connectors and 1 Input/Output Connector.

1. (VBAT) +12 VOLT POWER SUPPLY INPUT

    Screw Terminal 1 - Ground (-12V)
    Screw Terminal 2 - VBAT   (+12V)

2. (VRS) VARIABLE RELUCTANCE SENSOR INPUT
    Screw Terminal 1 - VRS- (Low Side)
    Screw Terminal 2 - VRS+ (High Side)

3. (ISO9141) 4 PIN INPUT/OUTPUT
    Terminal 1 - Ground
    Terminal 2 - N.C.
    Terminal 3 - VPWR
    Terminal 4 - ISO9141 bidirectional signal.

11.6.2 Output Connectors

There are ten Output Connectors which are two-position screw terminals that provides the following signals:

1) (COIL 1) IGNITION OUTPUT 1 -

    Screw Terminal 1 - Low side drive, IGNOUT1 (IGBT collector)
    Screw Terminal 2 - VBAT

2) (O2HFB) O2 Heater OUTPUT -

    Screw Terminal 1 - Low side drive, O2HOUT (MOSFET drain)
    Screw Terminal 2 - VBAT

3) (INJOUT1) INJECTOR OUTPUT 1 -

    Screw Terminal 1 - Low side drive, INJOUT1
    Screw Terminal 2 - VBAT

4) (ROUT1) RELAY OUTPUT 1 -

    Screw Terminal 1 - Low side drive, ROUT1
    Screw Terminal 2 - VBAT

5) (ROUT2) RELAY OUTPUT 2 -

    Screw Terminal 1 - Low side drive, ROUT2
    Screw Terminal 2 - VBAT

6) (LAMPOUT) LAMP DRIVER OUTPUT 2 -

    Screw Terminal 1 - Low side drive, LAMPOUT
    Screw Terminal 2 - VBAT

7) (TACHOUT) TACHOMETER DRIVER OUTPUT 2 -

Screw Terminal 1 - Low side drive, TACHOUT
Screw Terminal 2 - VBAT

8) (VPP) +6.5 VOLT REGULATOR OUTPUT -
Screw Terminal 1 - VPP OUTPUT
Screw Terminal 2 - GND

9) (VCC) +5 VOLT REGULATOR OUTPUT -
Screw Terminal 1 - VCC OUTPUT
Screw Terminal 2 - GND

10) (VPROT) PROTECTED +5 VOLT REGULATOR OUTPUT -
Screw Terminal 1 - VPROT OUTPUT
Screw Terminal 2 - GND

12   Accessory Board

This kit may be used with Freescale's one of the following kits:

The KITUSBSPIDGLEVME Evaluation board (shown below) provides a USB to SPI interface that features the MC68HC908JW32 with Dongle. It is a working hardware/software example that allows a user to become familiar with the MC68HC908JW32 microcontroller by means of an actual useful application, a USB to SPI and USB to parallel converter. The main function provided by this kit is to allow a PC, that may not have a parallel port, to communicate with other Freescale Evaluation Kits, via a USB port. The USB port is a standard feature on almost every new PC. This kit makes use of the MC68HC908JW32's built-in USB, SPI and parallel ports.
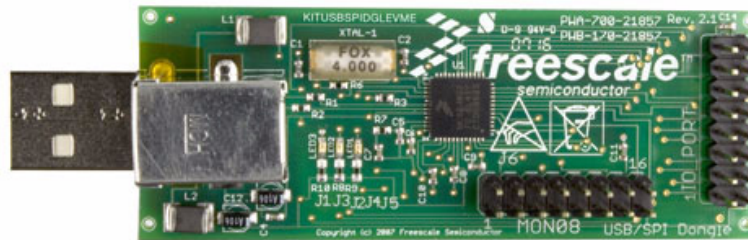
Figure 6. KITUSBSPIDGLEVME Evaluation Kit

13   Schematic
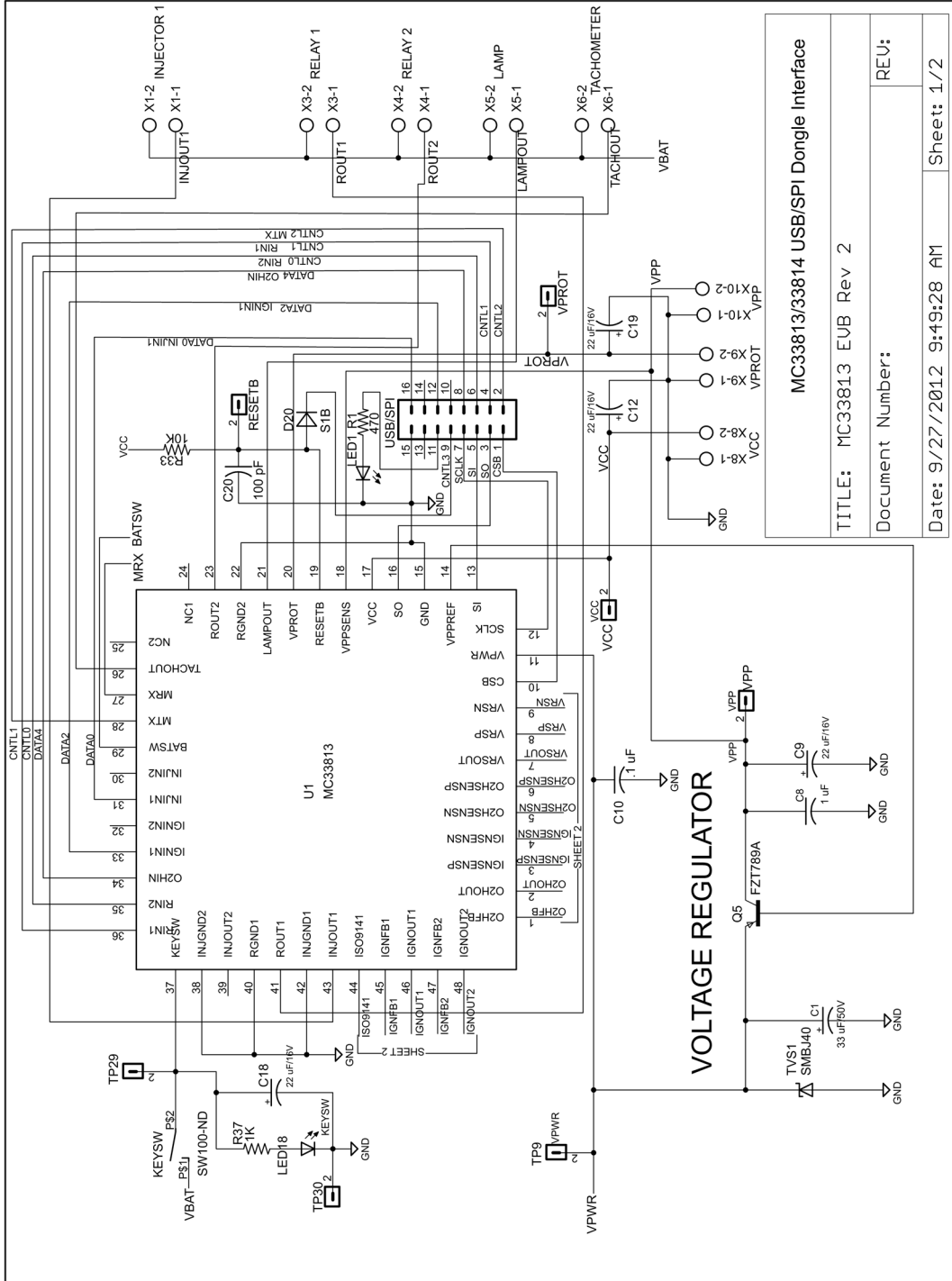
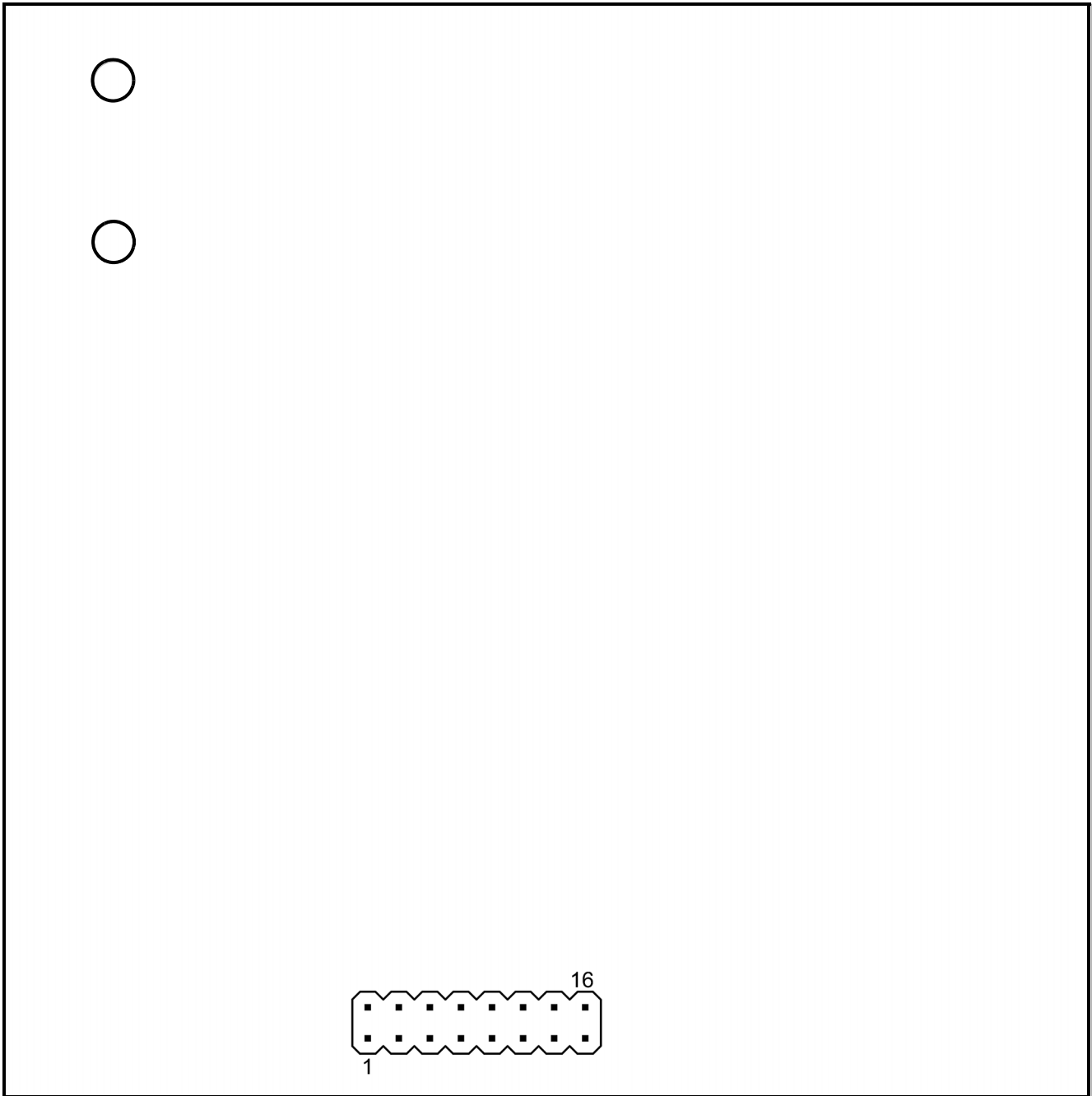**Figure 7. Evaluation Board Schematic, Part 1**
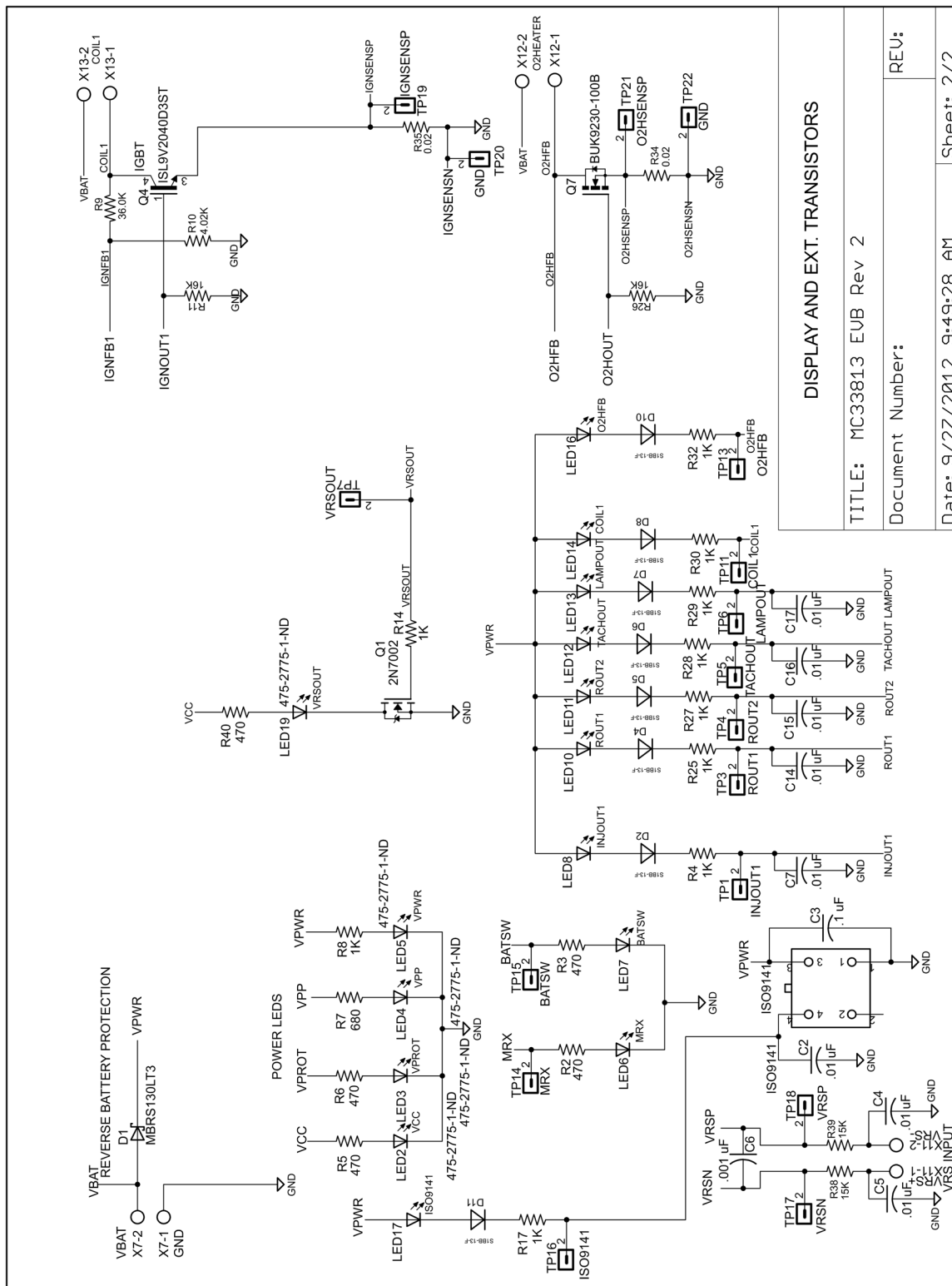
Figure 8. Evaluation Board Schematic, Part 2

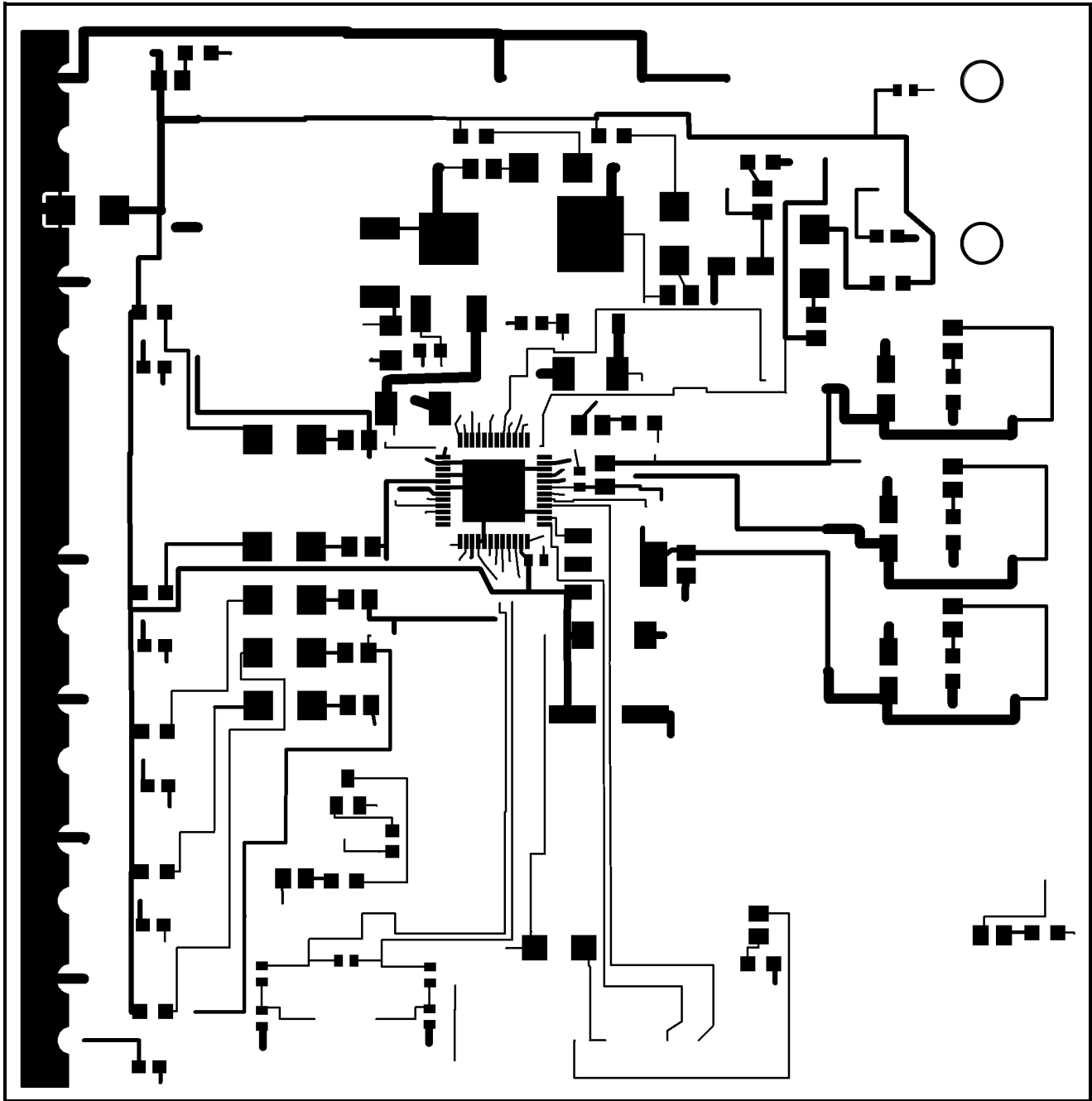# 14   Board Layout

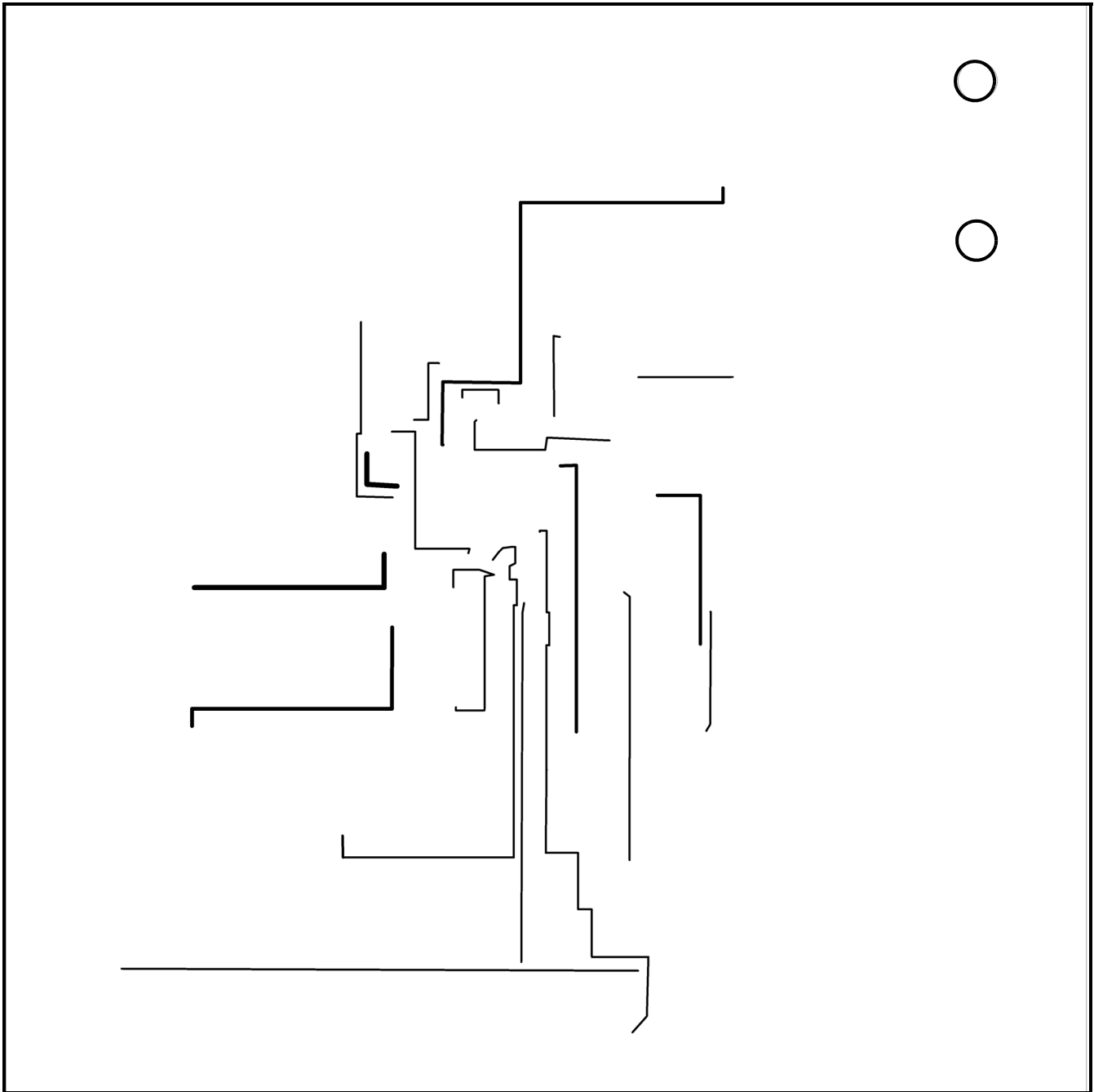## 14.1   Assembly Layer Top
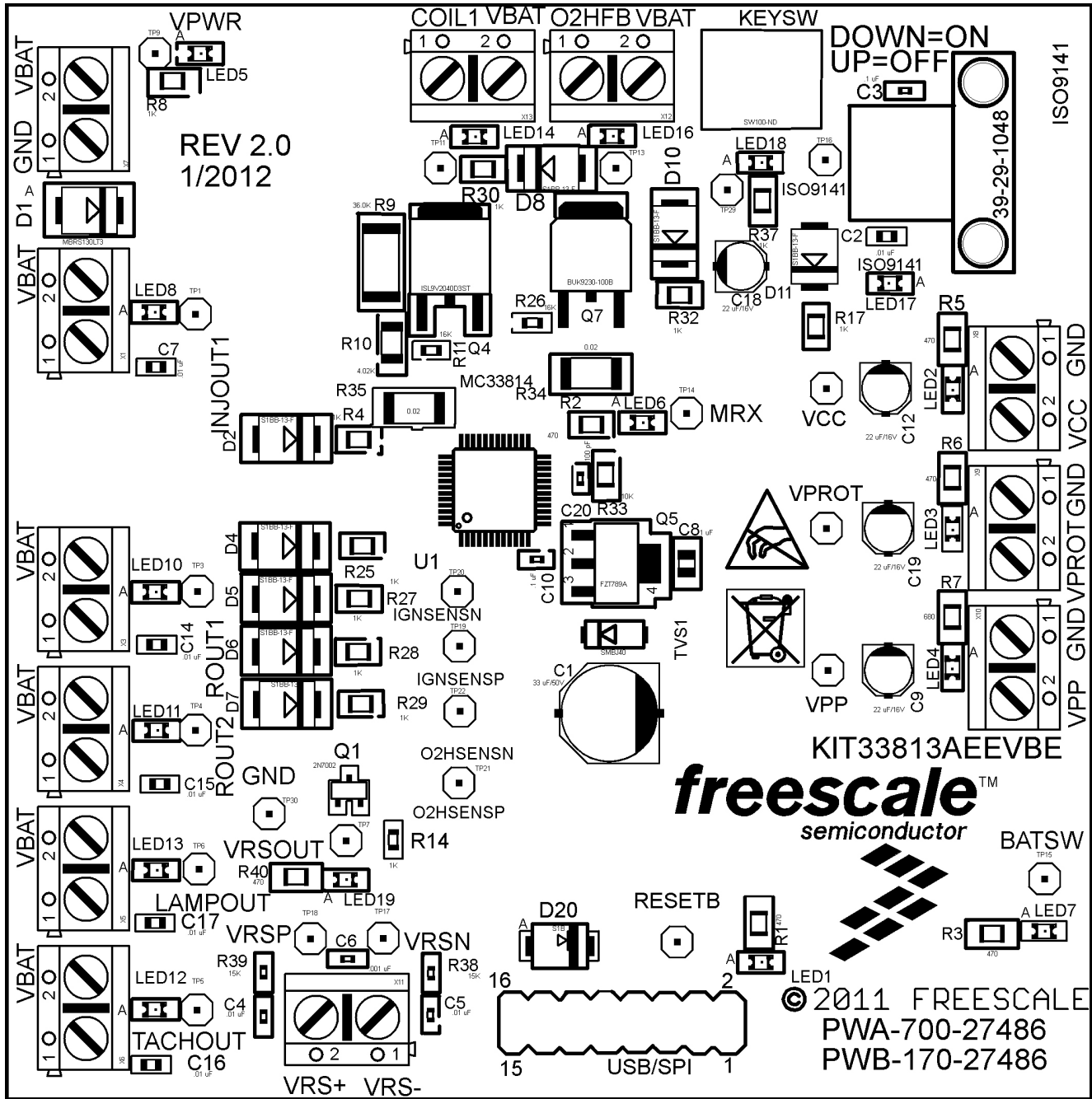
14.2   Assembly Layer Bottom

Note: For convenience when viewing the actual board, this image has been flipped horizontally with respect to the other layer images in this document.
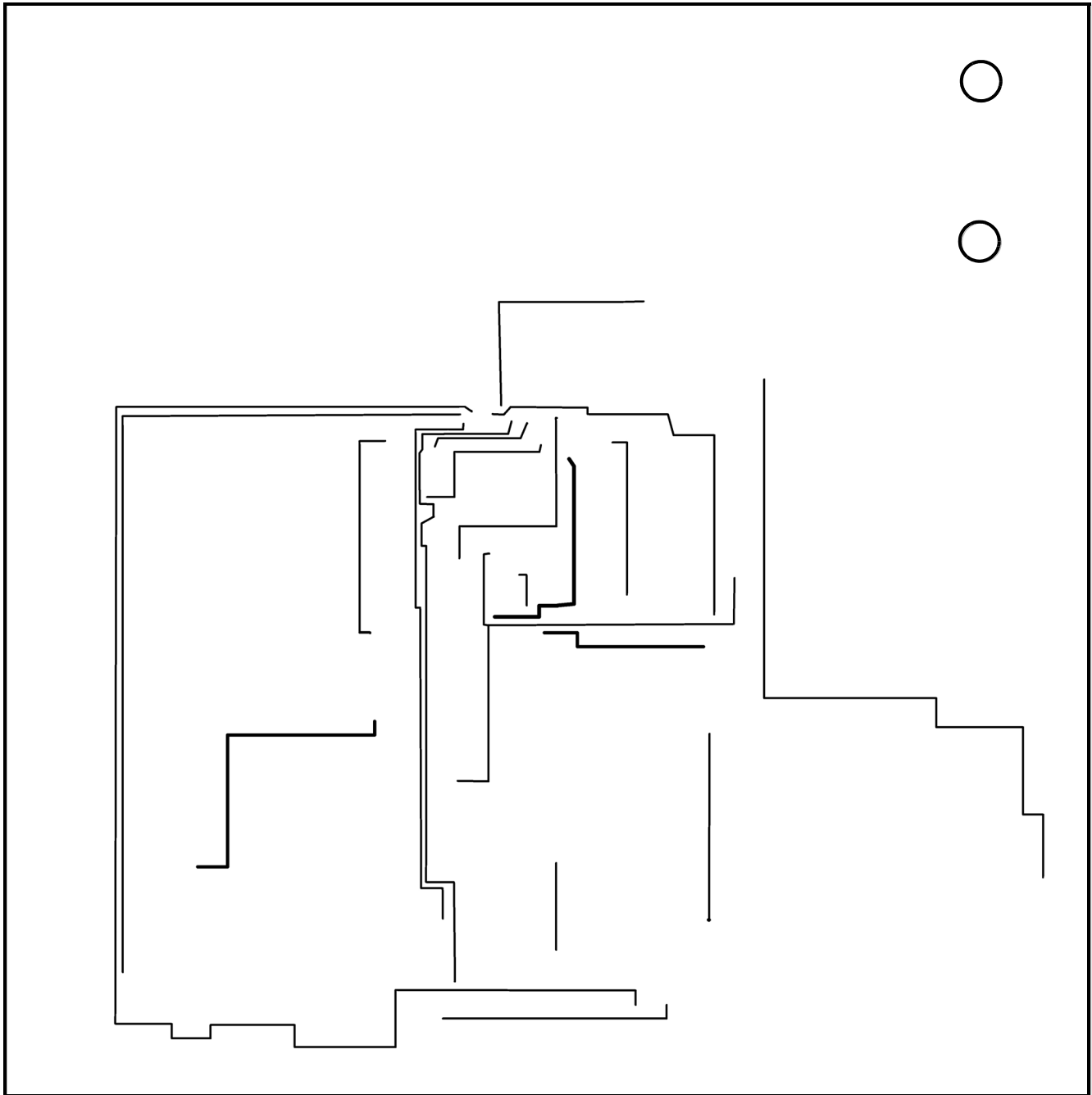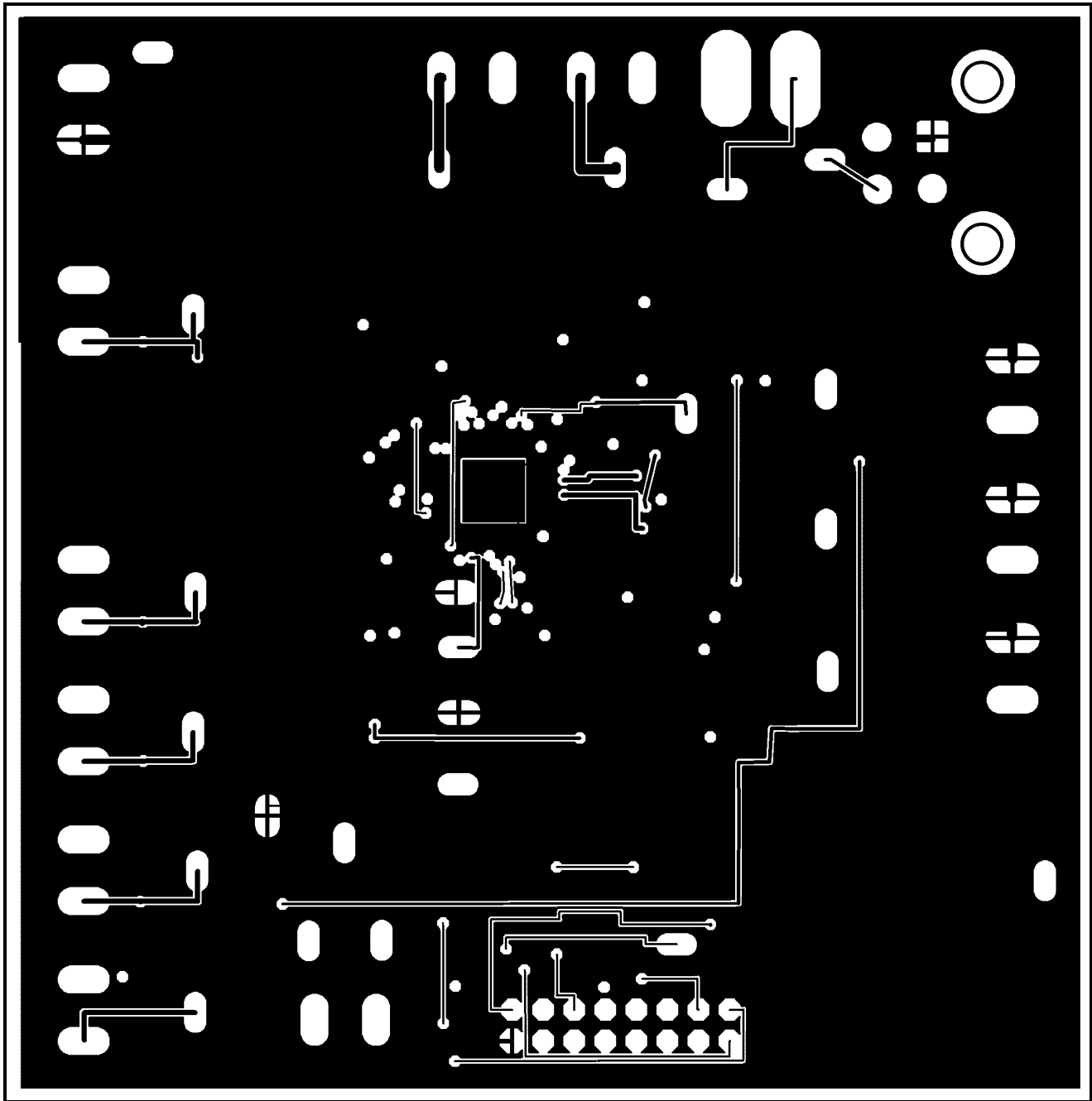
14.3   Top Layer Routing

14.4   Inner Layer 1 Routing

14.5   Inner Layer 2 Routing

14.6   Bottom Layer Routing

15 Bill of Material

Item	Qty	Schematic Label	Value	Description	Package
1	2	C1,C11	33 µF/50V	CAP ALUM 33UF 50V 20% SMD	PANASONIC_E
2	2	C2,C7,	.01 µF	CAP CER 10000PF 100V X7S 0402	C0603
3	2	C3,C10	.1 µF	CAP CER 0.1UF 25V Y5V 0402	C0402
4	6	C4,C5,C14-C17 (No C13)	.01 µF	CAP CER 10000PF 100V X7S 0402	C0402
5	1	C6	.001 µF	CAP CER 1000PF 100V 10% X7R 0402	C0402
6	1	C8	1 µF	CAP CER 1UF 16V Y5V 0805	C0805
7	3	C9,C12, C18,C19	22 µF/16V	CAP ALUM 22UF 16V 20% SMD	PANASONIC_B
8	1	C20	100 pF	CAP CER 100PF 50V 5% NP0 0402	C0402
9	1	D1	SK35B-LTP	DIODE SCHOTTKY 3A 50V SMB	SMB
10	8	D2, D4-D8, D10,D11 (No D9 or D3)	S1B	RECTIFIER GPP 100V 1A SMB	
11	1	D20	S1A	DIODE SCHOTTKY 30V 1A SMA	SMA
12	1	ISO9141	39-29-1048	CONN HEADER 4POS 4.2MM R/A TIN	5566-4A
13	1	KEYSW	SW100-ND	SWITCH SLIDE SPST 0.5A BLACK	G-105-0513
14	17	LED1-LED8, LED10-LED14, LED16-LED19 (No LED15 or LED9)	LED	LED MINI TOPLED GREEN 529NM SMD	CHIPLED_0805
15	1	Q1	2N7002	MOSFET N-CH 60V 115MA SOT-23	SOT23
16	1	Q4 (No Q6)	ISL9V2040D3	IGBT 440V 20A 125W DPAK	DPAK
17	1	Q5	FZT789A	TRANS PNP -25V -3000MA SOT-223	SOT223
18	1	Q7	BUK9230-100B	MOSFET N-CH 100V 47A DPAK	D-PAK_TO252AA
19	6	R1-R3,R5,R6,R40	470	RES 470 OHM 1/8W 5% 0805 SMD	M0805
20	11	R4,R8,R14,R17,R25, R27-R30,R32,R37 (No R24 or R31)	1K	RES 15K OHM 1/10W 5% 0402 SMD	M0805
21	1	R7	680	RES 680 OHM 1/8W 5% 0805 SMD	M0805
22	1	R9, (No R12)	36.0K	RES 36K OHM 1W 5% 2512 SMD	R2512
23	1	R10, (No R13)	4.02K	RES 4.02K OHM 1/4W 1% 1206 SMD	R1206
24	2	R11, R26 (No R23)	16K	RES 16K OHM 1/10W 5% 0603 SMD	R0603

Item	Qty	Schematic Label	Value	Description	Package
25	1	R33	10K	RES 10K OHM 1/8W 5% 0805 SMD	M0805
26	2	R34,R35	0.02	RES 0.02 OHM 1/2W 1% 2010 SMD	R2010
27	2	R38,39	15K	RES 15K OHM 1/10W 5% 0402 SMD	R0402
28	22	RESETB,TP1-7,TP9, TP11, TP13-TP18, TP20-TP22,TP29,TP 30,VCC,VPP,VPROT (No TP12 or TP19)	MA01-1	TERM PC TEST POINT LOOP 0.020"BR	MA01-1
29	1	TVS1	SMBJ40	DIODE TVS 40V 600W UNIDIR 5% SMB	DO214AA@1
30	1	U1	MC33813AE	One Cylinder Small Engine Control IC	TQFP48_7X7
31	1	USB/SPI	Header	CONN HEADER VERT 0.100 16POS 15AU	MA08-2
32	12	X1, X3-X13 (No X14 or X2)	Dual Screw terminal	CONN TERM BLOCK 2POS 5.08MM PCB	AK500/2

Note: Freescale does not assume liability, endorse, or warrant components from external manufacturers that are referenced in circuit drawings or tables. While Freescale offers component recommendations in this configuration, it is the customer's responsibility to validate their application.

16   References

Following are URLs where you can obtain information on other Freescale products and application solutions:

Freescale.com Support Pages	URL
MC33813 Product Summary Page	http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=MC33813
KITUSBSPIDGLEVME Tool Summary Page	http://www.freescale.com/webapp/sps/site/ prod_summary.jsp?code=KITUSBSPIDGLEVME
SPIGen Tool Summary Page	http://www.freescale.com/files/soft_dev_tools/software/device_drivers/ SPIGen.html?fsrch=1&sr=11
Automotive Home Page	http://www.freescale.com/automotive
Analog Home Page	http://www.freescale.com/analog

16.1   Support

Visit Freescale.com/support for a list of phone numbers within your region.

16.2   Warranty

Visit Freescale.com/warranty for a list of phone numbers within your region.

17   Revision History

REVISION	DATE	DESCRIPTION OF CHANGES
1.0	12/2012	• Initial Release
2.0	4/2013	• Add Jump Start link for downloading software and/or documents. • Update SPIGen section to match latest template